



## SEQUENCE LISTING

<110> Fader, Gary M.  
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<120> Nucleic Acid Fragments Encoding Isoflavone Synthase

<130> BB-1339

<140> 09/857,581

<141> 2001-05-06

<150> PCT/US00/01,772

<151> 2000-01-26

<150> 60/117769

<151> 1999-01-27

<150> 60/144783

<151> 1999-07-20

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<151> 1999-09-24

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Pro Asn Pro Pro Ser Pro Lys Pro Arg Leu Pro Phe Ile Gly His Leu
      35             40             45

His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Leu Ile Asp Leu Ser
      50             55             60

Lys Lys His Gly Pro Leu Phe Ser Leu Ser Phe Gly Ser Met Pro Thr
      65             70             75             80

Val Val Ala Ser Thr Pro Glu Leu Phe Lys Leu Phe Leu Gln Thr His
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Glu Ala Thr Ser Phe Asn Thr Arg Phe Gln Thr Ser Ala Ile Arg Arg
      100            105            110

Leu Thr Tyr Asp Asn Ser Val Ala Met Val Pro Phe Gly Pro Tyr Trp
      115            120            125

Lys Phe Val Arg Lys Leu Ile Met Asn Asp Leu Leu Asn Ala Thr Thr
      130            135            140

Val Asn Lys Leu Arg Pro Leu Arg Thr Gln Gln Ile Arg Lys Phe Leu
      145            150            155            160

Arg Val Met Ala Gln Ser Ala Glu Ala Gln Lys Pro Leu Asp Val Thr
      165            170            175

Glu Glu Leu Leu Lys Trp Thr Asn Ser Thr Ile Ser Met Met Met Leu
      180            185            190

Gly Glu Ala Glu Glu Ile Arg Asp Ile Ala Arg Glu Val Leu Lys Ile
      195            200            205

Phe Gly Glu Tyr Ser Leu Thr Asp Phe Ile Trp Pro Leu Lys Tyr Leu
      210            215            220

Lys Val Gly Lys Tyr Glu Lys Arg Ile Asp Asp Ile Leu Asn Lys Phe
      225            230            235            240

Asp Pro Val Val Glu Arg Val Ile Lys Lys Arg Arg Glu Ile Val Arg

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 Pro Asn Pro Pro Ser Pro Lys Pro Arg Leu Pro Phe Ile Gly His Leu  
 35 40 45  
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 Lys Lys His Gly Pro Leu Phe Ser Leu Tyr Phe Gly Ser Met Pro Thr  
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Ile	Leu	Lys	Gly	Gly	Asp	Ala	Lys	Val	Ser	Met	Glu	Glu	Arg	Ala	Gly
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Leu	Thr	Val	Pro	Arg	Ala	His	Ser	Leu	Val	Cys	Val	Pro	Leu	Ala	Arg
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22

<210> 15  
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 <213> Medicago sativa

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 aactttctcca ctatgcactc atcgatctct ccaaaaagca tggcccctta ttctctctct 180  
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<210> 16  
 <211> 499  
 <212> PRT  
 <213> Medicago sativa

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 His Leu His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Leu Ile Asp  
 35 40 45  
 Leu Ser Lys Lys His Gly Pro Leu Phe Ser Leu Ser Phe Gly Ser Met  
 50 55 60



Pro	Thr	Val	Val	Ala	Ser	Thr	Pro	Glu	Leu	Phe	Lys	Leu	Phe	Leu	Gln	65	70	75	80
Thr	His	Glu	Ala	Thr	Ser	Phe	Asn	Thr	Arg	Phe	Gln	Thr	Ser	Ala	Thr	85	90	95	
Arg	Arg	Leu	Thr	Tyr	Asp	Asn	Ser	Val	Ala	Met	Val	Pro	Phe	Gly	Pro	100	105	110	
Tyr	Trp	Arg	Phe	Val	Arg	Lys	Leu	Ile	Met	Asn	Asp	Leu	Leu	Asn	Ala	115	120	125	
Thr	Thr	Val	Asn	Lys	Leu	Arg	Pro	Leu	Arg	Thr	Gln	Gln	Ile	Arg	Lys	130	135	140	
Phe	Leu	Arg	Val	Met	Ala	Gln	Ser	Ala	Glu	Ala	Gln	Lys	Pro	Leu	Asp	145	150	155	160
Val	Thr	Glu	Glu	Leu	Leu	Lys	Trp	Thr	Asn	Ser	Thr	Ile	Ser	Met	Met	165	170	175	
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Tyr	Leu	Lys	Val	Gly	Lys	Tyr	Glu	Lys	Arg	Ile	Asp	Asp	Ile	Leu	Asn	210	215	220	
Lys	Phe	Asp	Pro	Val	Val	Glu	Arg	Val	Ile	Lys	Lys	Arg	Arg	Gly	Ile	225	230	235	240
Val	Arg	Arg	Arg	Glu	Asn	Gly	Glu	Val	Val	Glu	Gly	Glu	Ala	Ser	Gly	245	250	255	
Val	Phe	Leu	Asp	Thr	Leu	Leu	Glu	Phe	Ala	Glu	Asp	Glu	Thr	Met	Glu	260	265	270	
Ile	Lys	Ile	Thr	Lys	Glu	Gln	Ile	Lys	Gly	Leu	Val	Val	Asp	Leu	Phe	275	280	285	
Ser	Ala	Gly	Thr	Asp	Ser	Thr	Ala	Val	Ala	Thr	Glu	Trp	Ala	Leu	Ala	290	295	300	
Glu	Leu	Ile	Asn	Asn	Pro	Arg	Val	Leu	Gln	Lys	Ala	Arg	Glu	Glu	Val	305	310	315	320
Tyr	Ser	Val	Val	Gly	Lys	Asp	Arg	Leu	Val	Asp	Glu	Val	Asp	Thr	Gln	325	330	335	
Asn	Leu	Pro	Tyr	Ile	Arg	Ala	Ile	Val	Lys	Glu	Thr	Phe	Arg	Met	His	340	345	350	
Pro	Pro	Leu	Pro	Val	Val	Lys	Arg	Lys	Cys	Thr	Glu	Glu	Cys	Glu	Ile	355	360	365	
Asn	Gly	Tyr	Val	Ile	Pro	Glu	Gly	Ala	Leu	Val	Leu	Phe	Asn	Val	Trp	370	375	380	

Gln Val Gly Arg Asp Pro Lys Tyr Trp Asp Arg Pro Ser Glu Phe Arg  
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 Asp Leu Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg  
 420 425 430  
 Arg Met Cys Pro Gly Val Asn Leu Ala Thr Ser Gly Met Ala Thr Leu  
 435 440 445  
 Leu Ala Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln  
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Ala Arg Ile

<210> 17  
 <211> 1501  
 <212> DNA  
 <213> Vicia villosa

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<210> 18  
 <211> 499

<212> PRT

<213> Vicia villosa

<400> 18

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Lys	Ile	Tyr	Gly	Glu	Tyr	Ser	Leu	Thr	Asp	Phe	Ile	Trp	Pro	Leu	Lys	
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His	Leu	Lys	Val	Gly	Lys	Tyr	Glu	Lys	Arg	Ile	Asp	Asp	Ile	Leu	Asn	
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Ala Arg Ile

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<211> 1501

<212> DNA

<213> Lens culinaris

<400> 19

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<210> 20

<211> 499

<212> PRT

<213> *Lens culinaris*

<400> 20

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      50             55             60

Pro Thr Val Val Ala Ser Thr Pro Glu Leu Phe Lys Leu Phe Leu Gln
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Thr His Glu Ala Thr Ser Phe Asn Thr Arg Phe Gln Thr Ser Ala Ile
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Arg Arg Leu Thr Tyr Asp Ser Ser Val Ala Met Val Pro Phe Gly Pro
      100            105            110

Tyr Trp Lys Phe Val Arg Lys Leu Ile Met Asn Asp Leu Leu Asn Ala
      115            120            125

Thr Thr Val Asn Lys Leu Arg Pro Leu Arg Thr Gln Gln Ile Arg Lys
      130            135            140

Phe Leu Arg Val Met Ala Gln Ser Ala Glu Ala Gln Lys Pro Leu Asp
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Val Thr Glu Glu Leu Leu Lys Trp Thr Asn Ser Thr Ile Ser Met Met
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Met Leu Gly Glu Ala Glu Glu Ile Arg Asp Ile Ala Arg Glu Val Leu
      180            185            190

Lys Ile Phe Gly Glu Tyr Ser Leu Thr Asp Phe Ile Trp Pro Leu Lys
      195            200            205

Tyr Leu Lys Val Gly Lys Tyr Glu Lys Arg Ile Asp Asp Ile Leu Asn
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 Tyr Ser Val Val Gly Lys Asp Ile Leu Val Asp Glu Val Asp Thr Gln  
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 Asp Leu Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg  
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Ala Arg Ile

<210> 21

<211> 1501

<212> DNA

<213> Lens culinaris

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<211> 499  
<212> PRT  
<213> Lens culinaris

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Tyr Trp Lys Phe Val Arg Lys Leu Ile Met Asn Asp Leu Leu Asn Ala  
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Pro	Glu	Arg	Phe	Leu	Glu	Thr	Gly	Ala	Glu	Gly	Glu	Ala	Arg	Pro	Leu	405	410	415	
Asp	Leu	Arg	Gly	Arg	His	Phe	Gln	Leu	Leu	Pro	Phe	Gly	Ser	Gly	Arg	420	425	430	
Arg	Met	Cys	Pro	Gly	Val	Asn	Leu	Ala	Thr	Ser	Gly	Met	Ala	Thr	Leu	435	440	445	
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<210> 23

<211> 1566

<212> DNA

<213> Phaseolus aureus

<400> 23

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<210> 24

<211> 522

<212> PRT

<213> Phaseolus aureus

<400> 24

Met Leu Leu Glu Leu Ala Leu Gly Leu Leu Val Leu Ala Leu Phe Leu  
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His Leu Arg Pro Thr Pro Thr Ala Lys Ser Lys Ala Leu Arg His Leu  
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Pro Asn Pro Pro Ser Pro Lys Pro Arg Leu Pro Phe Ile Gly His Leu  
 35 40 45

His	Leu	Leu	Lys	Asp	Lys	Leu	Leu	His	Tyr	Ala	Leu	Ile	Asp	Leu	Ser	50	55	60	
Lys	Lys	His	Gly	Pro	Leu	Phe	Ser	Leu	Tyr	Phe	Gly	Ser	Met	Pro	Thr	65	70	75	80
Val	Val	Ala	Ser	Thr	Pro	Glu	Leu	Phe	Lys	Leu	Phe	Leu	Gln	Thr	His	85	90	95	
Glu	Ala	Thr	Ser	Phe	Asn	Thr	Arg	Phe	Gln	Thr	Ser	Ala	Ile	Arg	Arg	100	105	110	
Leu	Thr	Tyr	Asp	Ser	Ser	Val	Ala	Met	Val	Pro	Phe	Gly	Pro	Tyr	Trp	115	120	125	
Lys	Phe	Val	Arg	Lys	Leu	Ile	Met	Asn	Asp	Leu	Leu	Asn	Ala	Thr	Thr	130	135	140	
Val	Asn	Lys	Leu	Arg	Pro	Leu	Arg	Thr	Gln	Gln	Ile	Arg	Lys	Phe	Leu	145	150	155	160
Arg	Val	Met	Ala	Gln	Gly	Ala	Glu	Ala	Gln	Lys	Pro	Leu	Asp	Leu	Thr	165	170	175	
Glu	Glu	Leu	Leu	Lys	Trp	Thr	Asn	Ser	Thr	Ile	Ser	Met	Met	Met	Leu	180	185	190	
Gly	Glu	Ala	Glu	Glu	Ile	Arg	Asp	Ile	Ala	Arg	Glu	Val	Leu	Lys	Ile	195	200	205	
Phe	Gly	Glu	Tyr	Ser	Leu	Thr	Asp	Phe	Ile	Trp	Pro	Leu	Lys	His	Leu	210	215	220	
Lys	Val	Gly	Lys	Tyr	Glu	Lys	Arg	Ile	Asp	Asp	Ile	Leu	Asn	Lys	Phe	225	230	235	240
Asp	Pro	Val	Val	Glu	Arg	Val	Ile	Lys	Lys	Arg	Arg	Glu	Ile	Val	Arg	245	250	255	
Arg	Arg	Lys	Asn	Gly	Glu	Val	Val	Glu	Gly	Glu	Val	Ser	Gly	Val	Phe	260	265	270	
Leu	Asp	Thr	Leu	Leu	Glu	Phe	Ala	Glu	Asp	Glu	Thr	Met	Glu	Ile	Lys	275	280	285	
Ile	Thr	Lys	Asp	His	Ile	Lys	Gly	Leu	Val	Val	Asp	Phe	Phe	Ser	Ala	290	295	300	
Gly	Thr	Asp	Ser	Thr	Ala	Val	Ala	Thr	Glu	Trp	Ala	Leu	Ala	Glu	Leu	305	310	315	320
Ile	Asn	Asn	Pro	Lys	Val	Leu	Glu	Lys	Ala	Arg	Glu	Glu	Ala	Tyr	Ser	325	330	335	
Val	Val	Gly	Lys	Asp	Arg	Leu	Val	Asp	Glu	Val	Asp	Thr	Gln	Asn	Leu	340	345	350	
Pro	Tyr	Ile	Arg	Ala	Ile	Val	Lys	Glu	Thr	Phe	Arg	Met	His	Pro	Pro	355	360	365	

Leu Pro Val Val Lys Arg Lys Cys Thr Glu Glu Cys Glu Ile Asn Gly  
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 Tyr Val Ile Pro Glu Gly Ala Leu Ile Leu Phe Asn Val Trp Gln Val  
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 Gly Arg Asp Pro Lys Tyr Trp Asp Arg Pro Ser Glu Phe Arg Pro Glu  
 405 410 415  
 Arg Phe Leu Glu Thr Gly Ala Glu Gly Glu Ala Arg Pro Leu Asp Leu  
 420 425 430  
 Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg Arg Met  
 435 440 445  
 Cys Pro Gly Val Asn Leu Ala Thr Ser Gly Met Ala Thr Leu Leu Ala  
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 Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln Gly Gln  
 465 470 475 480  
 Ile Leu Lys Gly Gly Asp Ala Lys Val Ser Met Glu Glu Arg Ala Gly  
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 <211> 1566  
 <212> DNA  
 <213> Phaseolus aureus

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<210> 26

<211> 521

<212> PRT

<213> Phaseolus aureus

<400> 26

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Pro	Asn	Pro	Pro	Ser	Pro	Lys	Pro	Arg	Leu	Pro	Phe	Ile	Gly	His	Leu	35	40	45	
His	Leu	Leu	Lys	Asp	Lys	Leu	Leu	His	Tyr	Ala	Leu	Ile	Asp	Leu	Ser	50	55	60	
Lys	Lys	His	Gly	Pro	Leu	Phe	Ser	Leu	Tyr	Phe	Gly	Ser	Met	Pro	Thr	65	70	75	80
Val	Val	Ala	Ser	Thr	Pro	Glu	Leu	Phe	Lys	Leu	Phe	Leu	Gln	Thr	His	85	90	95	
Glu	Ala	Thr	Ser	Phe	Asn	Thr	Arg	Phe	Gln	Thr	Ser	Ala	Ile	Arg	Arg	100	105	110	
Leu	Thr	Tyr	Asp	Ser	Ser	Val	Ala	Met	Val	Pro	Phe	Gly	Pro	Tyr	Trp	115	120	125	
Lys	Phe	Val	Arg	Lys	Leu	Ile	Met	Asn	Asp	Leu	Leu	Asn	Ala	Thr	Thr	130	135	140	
Val	Asn	Lys	Leu	Arg	Pro	Leu	Arg	Thr	Gln	Gln	Ile	Arg	Lys	Phe	Leu	145	150	155	160
Arg	Ala	Met	Ala	Gln	Gly	Ala	Glu	Ala	Gln	Lys	Pro	Leu	Asp	Leu	Thr	165	170	175	
Glu	Glu	Leu	Leu	Lys	Trp	Thr	Asn	Ser	Thr	Ile	Ser	Met	Met	Met	Leu	180	185	190	
Gly	Glu	Ala	Glu	Glu	Ile	Arg	Asp	Ile	Ala	Arg	Glu	Val	Leu	Lys	Ile	195	200	205	
Phe	Gly	Glu	Tyr	Ser	Leu	Thr	Asp	Phe	Ile	Trp	Pro	Leu	Lys	His	Leu	210	215	220	
Lys	Val	Gly	Lys	Tyr	Glu	Lys	Arg	Ile	Asp	Asp	Ile	Leu	Asn	Lys	Phe	225	230	235	240
Asp	Pro	Val	Val	Glu	Arg	Val	Ile	Lys	Lys	Arg	Arg	Glu	Ile	Val	Arg	245	250	255	
Arg	Arg	Lys	Asn	Gly	Glu	Val	Val	Glu	Gly	Glu	Val	Ser	Gly	Val	Phe	260	265	270	

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 275 280 285  
 Ile Thr Lys Asp His Ile Lys Gly Leu Val Val Asp Phe Phe Ser Ala  
 290 295 300  
 Gly Thr Asp Ser Thr Ala Val Ala Thr Glu Trp Ala Leu Ala Glu Leu  
 305 310 315 320  
 Ile Asn Asn Pro Lys Val Leu Glu Lys Ala Arg Glu Glu Val Tyr Ser  
 325 330 335  
 Val Val Gly Lys Asp Arg Leu Val Asp Glu Val Asp Thr Gln Asn Leu  
 340 345 350  
 Pro Tyr Ile Arg Ala Ile Val Lys Glu Thr Phe Arg Met His Pro Pro  
 355 360 365  
 Leu Pro Val Val Lys Arg Lys Cys Thr Glu Glu Cys Glu Ile Asn Gly  
 370 375 380  
 Tyr Val Ile Pro Glu Gly Ala Leu Ile Leu Phe Asn Val Trp Gln Val  
 385 390 395 400  
 Gly Arg Asp Pro Lys Tyr Trp Asp Arg Pro Ser Glu Phe Arg Pro Glu  
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 Arg Phe Leu Glu Thr Gly Ala Glu Gly Glu Ala Arg Pro Leu Asp Leu  
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 Cys Pro Gly Val Asn Leu Ala Thr Ser Gly Met Ala Thr Leu Leu Ala  
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 465 470 475 480  
 Ile Leu Lys Gly Gly Asp Ala Lys Val Ser Met Glu Glu Arg Ala Gly  
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<210> 27

<211> 1566

<212> DNA

<213> *Phaseolus aureus*

<400> 27

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<210> 28

<211> 521

<212> PRT

<213> Phaseolus aureus

<400> 28

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Met Leu Leu Glu Leu Ala Leu Gly Leu Leu Val Leu Ala Leu Phe Leu
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His Leu Arg Pro Thr Pro Thr Ala Lys Ser Lys Ala Leu Arg His Leu
      20                      25                     30

Pro Asn Pro Pro Ser Pro Lys Pro Arg Leu Pro Phe Ile Gly His Leu
      35                      40                     45

His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Leu Ile Asp Leu Ser
      50                      55                     60

Lys Lys His Gly Pro Leu Phe Ser Leu Tyr Phe Gly Ser Met Pro Thr
      65                      70                     75                     80

Val Val Ala Ser Thr Pro Glu Leu Phe Lys Leu Phe Leu Gln Thr His
      85                      90                     95

Glu Ala Thr Ser Phe Asn Thr Arg Phe Gln Thr Ser Ala Ile Arg Arg
      100                     105                    110

Leu Thr Tyr Asp Ser Ser Val Ala Met Val Pro Phe Gly Pro Tyr Trp
      115                     120                    125

Lys Phe Val Arg Lys Leu Ile Met Asn Asp Leu Leu Asn Ala Thr Thr
      130                     135                    140

Val Asn Lys Leu Arg Pro Leu Arg Thr Gln Gln Ile Arg Lys Phe Leu
      145                     150                    155                    160

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Glu	Glu	Leu	Leu	Lys	Trp	Thr	Asn	Ser	Thr	Ile	Ser	Met	Met	Met	Leu	
			180					185					190			
Gly	Glu	Ala	Glu	Glu	Ile	Arg	Asp	Ile	Ala	Arg	Glu	Val	Leu	Lys	Ile	
		195					200					205				
Phe	Gly	Glu	Tyr	Ser	Leu	Thr	Asp	Phe	Ile	Trp	Pro	Leu	Lys	His	Leu	
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Lys	Val	Gly	Lys	Tyr	Glu	Lys	Arg	Ile	Asp	Asp	Ile	Leu	Asn	Lys	Phe	
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Asp	Pro	Val	Val	Glu	Arg	Val	Ile	Lys	Lys	Arg	Arg	Glu	Ile	Val	Arg	
				245					250					255		
Arg	Arg	Lys	Asn	Gly	Glu	Val	Val	Glu	Gly	Glu	Val	Ser	Gly	Val	Phe	
			260					265					270			
Leu	Asp	Thr	Leu	Leu	Glu	Phe	Ala	Glu	Asp	Glu	Thr	Thr	Glu	Ile	Lys	
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Ile	Thr	Lys	Asp	His	Ile	Lys	Gly	Leu	Val	Val	Asp	Phe	Phe	Ser	Ala	
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Gly	Thr	Asp	Ser	Thr	Ala	Val	Ala	Thr	Glu	Trp	Ala	Leu	Ala	Glu	Leu	
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				325					330					335		
Val	Val	Gly	Lys	Asp	Arg	Leu	Val	Asp	Glu	Val	Asp	Thr	Gln	Asn	Leu	
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Pro	Tyr	Ile	Arg	Ala	Ile	Val	Lys	Glu	Thr	Phe	Arg	Met	His	Pro	Pro	
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Leu	Pro	Val	Val	Lys	Arg	Lys	Cys	Thr	Glu	Glu	Cys	Glu	Ile	Asn	Gly	
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Tyr	Val	Ile	Pro	Glu	Gly	Ala	Leu	Ile	Leu	Phe	Asn	Val	Trp	Gln	Val	
385					390					395					400	
Gly	Arg	Asp	Pro	Lys	Tyr	Trp	Asp	Arg	Pro	Ser	Glu	Phe	Arg	Pro	Glu	
				405					410					415		
Arg	Phe	Leu	Glu	Thr	Gly	Ala	Glu	Gly	Glu	Ala	Arg	Pro	Leu	Asp	Leu	
			420					425					430			
Arg	Gly	Gln	His	Phe	Gln	Leu	Leu	Pro	Phe	Gly	Ser	Gly	Arg	Arg	Met	
		435					440					445				
Cys	Pro	Gly	Val	Asn	Leu	Ala	Thr	Ser	Gly	Met	Ala	Thr	Leu	Leu	Ala	
	450					455					460					
Ser	Leu	Ile	Gln	Cys	Phe	Asp	Leu	Gln	Val	Leu	Gly	Pro	Gln	Gly	Gln	
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Ile Leu Lys Gly Gly Asp Ala Lys Val Ser Met Glu Glu Arg Ala Gly  
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<212> DNA  
<213> Phaseolus aureus

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<210> 30  
<211> 521  
<212> PRT  
<213> Phaseolus aureus

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Pro Asn Pro Pro Ser Pro Lys Pro Arg Leu Pro Phe Ile Gly His Leu  
35 40 45  
His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Leu Ile Asp Leu Ser  
50 55 60



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Val	Val	Ala	Ser	Thr	Pro	Glu	Leu	Phe	Lys	Leu	Phe	Leu	Gln	Thr	His	
				85					90					95		
Glu	Ala	Thr	Ser	Phe	Asn	Thr	Arg	Phe	Gln	Thr	Ser	Ala	Ile	Arg	Arg	
			100					105					110			
Leu	Thr	Tyr	Asp	Ser	Ser	Val	Ala	Met	Val	Pro	Phe	Gly	Pro	Tyr	Trp	
		115					120					125				
Lys	Phe	Val	Arg	Lys	Leu	Ile	Met	Asn	Asp	Leu	Leu	Asn	Ala	Thr	Thr	
	130					135					140					
Val	Asn	Lys	Leu	Arg	Pro	Leu	Arg	Thr	Gln	Gln	Ile	Arg	Lys	Phe	Leu	
145					150					155					160	
Arg	Val	Met	Ala	Gln	Gly	Ala	Glu	Ala	Gln	Lys	Pro	Leu	Asp	Leu	Thr	
				165					170					175		
Glu	Glu	Leu	Leu	Lys	Trp	Thr	Asn	Ser	Thr	Ile	Ser	Met	Met	Met	Leu	
			180					185					190			
Gly	Glu	Ala	Glu	Glu	Ile	Arg	Asp	Ile	Ala	Arg	Glu	Val	Leu	Lys	Ile	
		195					200					205				
Phe	Gly	Glu	Tyr	Ser	Leu	Thr	Asp	Phe	Ile	Trp	Pro	Leu	Lys	His	Leu	
	210					215					220					
Lys	Val	Gly	Lys	Tyr	Glu	Lys	Arg	Ile	Asp	Asp	Ile	Leu	Asn	Lys	Phe	
225					230					235					240	
Asp	Pro	Val	Val	Glu	Arg	Val	Ile	Lys	Lys	Arg	Arg	Glu	Ile	Val	Arg	
				245					250					255		
Arg	Arg	Lys	Asn	Gly	Glu	Val	Val	Glu	Gly	Glu	Val	Ser	Gly	Val	Phe	
			260					265					270			
Leu	Asp	Thr	Leu	Leu	Glu	Phe	Ala	Glu	Asp	Glu	Thr	Met	Glu	Ile	Lys	
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Val	Val	Gly	Lys	Asp	Arg	Leu	Val	Asp	Glu	Val	Asp	Thr	Gln	Asn	Leu	
			340					345					350			
Pro	Tyr	Ile	Arg	Ala	Ile	Val	Lys	Glu	Thr	Phe	Arg	Met	His	Pro	Pro	
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Leu	Pro	Val	Val	Lys	Arg	Lys	Cys	Thr	Glu	Glu	Cys	Glu	Ile	Asn	Gly	
	370					375					380					

Tyr Val Ile Pro Glu Gly Ala Leu Ile Leu Phe Asn Val Trp Gln Val  
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 Gly Arg Asp Pro Lys Tyr Trp Asp Arg Pro Ser Glu Phe Arg Pro Glu  
 405 410 415  
 Arg Phe Leu Glu Thr Gly Ala Glu Gly Glu Ala Arg Pro Leu Asp Leu  
 420 425 430  
 Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg Arg Met  
 435 440 445  
 Cys Pro Gly Val Asn Leu Ala Thr Ser Gly Met Ala Thr Leu Leu Ala  
 450 455 460  
 Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln Gly Gln  
 465 470 475 480  
 Ile Leu Lys Gly Gly Asp Ala Lys Val Ser Met Glu Glu Arg Ala Gly  
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 Ile Gly Val Ala Ser Lys Leu Leu Ser  
 515 520

<210> 31  
 <211> 1566  
 <212> DNA  
 <213> *Trifolium pratense*

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1566

<210> 32

<211> 521

<212> PRT

<213> *Trifolium pratense*

<400> 32

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His Leu Arg Pro Thr Pro Thr Ala Lys Ser Lys Ala Leu Arg His Leu  
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Pro Asn Pro Pro Ser Pro Lys Pro Arg Leu Pro Phe Ile Gly His Leu  
35 40 45

His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Leu Ile Asp Leu Ser  
50 55 60

Lys Lys His Gly Pro Leu Phe Ser Leu Tyr Phe Gly Ser Met Pro Thr  
65 70 75 80

Val Val Ala Ser Thr Pro Glu Leu Phe Lys Leu Phe Leu Gln Thr His  
85 90 95

Glu Ala Thr Ser Phe Asn Thr Arg Phe Gln Thr Ser Ala Ile Arg Arg  
100 105 110

Leu Thr Tyr Asp Ser Ser Val Ala Met Val Pro Ile Gly Pro Tyr Trp  
115 120 125

Lys Phe Val Arg Lys Leu Ile Met Asn Asp Leu Leu Asn Ala Thr Thr  
130 135 140

Val Asn Lys Leu Arg Pro Leu Arg Thr Gln Gln Ile Arg Lys Phe Leu  
145 150 155 160

Arg Val Met Ala Gln Gly Ala Glu Ala Gln Lys Pro Leu Asp Leu Thr  
165 170 175

Glu Glu Leu Leu Lys Trp Thr Asn Ser Thr Ile Ser Met Met Met Leu  
180 185 190

Gly Glu Ala Glu Glu Ile Arg Asp Ile Ala Arg Glu Val Leu Lys Ile  
195 200 205

Phe Gly Glu Tyr Ser Leu Thr Asp Phe Ile Trp Pro Leu Lys His Leu  
210 215 220

Lys Val Gly Lys Tyr Glu Lys Arg Ile Asp Asp Ile Leu Asn Lys Phe  
225 230 235 240

Asp Pro Val Val Glu Arg Val Ile Lys Lys Arg Arg Glu Ile Val Arg  
245 250 255

Arg Arg Lys Asn Gly Glu Val Asp Glu Gly Glu Val Ser Gly Val Phe  
260 265 270

Leu Asp Thr Leu Leu Glu Phe Ala Glu Asp Glu Thr Thr Glu Ile Lys  
 275 280 285  
 Ile Thr Lys Asp His Ile Lys Gly Leu Val Val Asp Phe Phe Ser Ala  
 290 295 300  
 Gly Thr Asp Ser Thr Ala Val Ala Thr Glu Trp Ala Leu Ala Glu Leu  
 305 310 315 320  
 Ile Asn Asn Pro Lys Val Leu Glu Lys Ala Arg Glu Glu Val Tyr Ser  
 325 330 335  
 Val Val Gly Lys Asp Arg Leu Val Asp Glu Val Asp Thr Gln Asn Leu  
 340 345 350  
 Pro Tyr Ile Arg Ala Ile Val Lys Glu Thr Phe Arg Met His Pro Pro  
 355 360 365  
 Leu Pro Val Val Lys Arg Lys Cys Thr Glu Glu Cys Glu Ile Asn Gly  
 370 375 380  
 Tyr Val Ile Pro Glu Gly Ala Leu Ile Leu Phe Asn Val Trp Gln Val  
 385 390 395 400  
 Gly Arg Asp Pro Lys Tyr Trp Asp Arg Pro Ser Glu Phe Arg Pro Glu  
 405 410 415  
 Arg Phe Leu Glu Thr Gly Ala Glu Gly Glu Ala Arg Pro Leu Asp Leu  
 420 425 430  
 Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg Arg Met  
 435 440 445  
 Cys Pro Gly Val Asn Leu Ala Thr Ser Gly Met Ala Thr Leu Leu Ala  
 450 455 460  
 Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln Gly Gln  
 465 470 475 480  
 Ile Leu Lys Gly Gly Asp Ala Lys Val Ser Met Glu Glu Arg Ala Gly  
 485 490 495  
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<210> 33

<211> 1566

<212> DNA

<213> *Trifolium pratense*

<400> 33

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cgtcttcct tcataggaca cttcatctc ttaaaagaca aacttctcca ctacgcactc 180
atcgacctct ccaaaaaaca tgggtccctta ttctctctct actttggctc catgccaaacc 240
gttggtgcct ccacaccaga attgttcaag ctcttcctcc aaacgcacga ggcaacttcc 300
ttcaacacaa ggttcacaaac ctcagccata agacgcctca cctatgatag ctcagtggcc 360
  
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<210> 34

<211> 521

<212> PRT

<213> *Trifolium pratense*

<400> 34

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			20					25					30		
Pro	Asn	Pro	Pro	Ser	Pro	Lys	Pro	Arg	Leu	Pro	Phe	Ile	Gly	His	Leu
			35				40					45			
His	Leu	Leu	Lys	Asp	Lys	Leu	Leu	His	Tyr	Ala	Leu	Ile	Asp	Leu	Ser
	50					55					60				
Lys	Lys	His	Gly	Pro	Leu	Phe	Ser	Leu	Tyr	Phe	Gly	Ser	Met	Pro	Thr
65					70					75				80	
Val	Val	Ala	Ser	Thr	Pro	Glu	Leu	Phe	Lys	Leu	Phe	Leu	Gln	Thr	His
				85					90					95	
Glu	Ala	Thr	Ser	Phe	Asn	Thr	Arg	Phe	Gln	Thr	Ser	Ala	Ile	Arg	Arg
			100					105					110		
Leu	Thr	Tyr	Asp	Ser	Ser	Val	Ala	Met	Val	Pro	Phe	Gly	Pro	Tyr	Trp
	115						120					125			
Lys	Phe	Val	Arg	Lys	Leu	Ile	Met	Asn	Asp	Leu	Leu	Asn	Ala	Thr	Thr
	130					135						140			
Val	Asn	Lys	Leu	Arg	Pro	Leu	Arg	Thr	Gln	Gln	Ile	Arg	Lys	Phe	Leu
145					150					155					160
Arg	Val	Met	Ala	Gln	Gly	Ala	Glu	Ala	Gln	Lys	Pro	Leu	Asp	Leu	Thr
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			180					185					190						
Gly	Glu	Ala	Glu	Glu	Ile	Arg	Asp	Ile	Ala	Arg	Glu	Val	Leu	Lys	Ile				
		195					200					205							
Phe	Gly	Glu	Tyr	Ser	Leu	Thr	Asp	Phe	Ile	Trp	Pro	Leu	Lys	His	Leu				
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Arg	Arg	Lys	Asn	Gly	Glu	Val	Val	Glu	Gly	Glu	Val	Ser	Gly	Val	Phe				
			260					265					270						
Leu	Asp	Thr	Leu	Leu	Glu	Phe	Ala	Glu	Asp	Glu	Thr	Thr	Glu	Ile	Lys				
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Val	Val	Gly	Lys	Asp	Arg	Leu	Val	Asp	Glu	Val	Asp	Thr	Gln	Asn	Leu				
			340					345					350						
Pro	Tyr	Ile	Arg	Ala	Ile	Val	Lys	Glu	Thr	Phe	Arg	Met	His	Pro	Pro				
		355					360					365							
Leu	Pro	Val	Val	Lys	Arg	Lys	Cys	Thr	Glu	Glu	Cys	Glu	Ile	Asn	Gly				
	370					375					380								
Tyr	Val	Ile	Pro	Glu	Gly	Ala	Leu	Ile	Leu	Phe	Asn	Val	Trp	Gln	Val				
385					390					395					400				
Gly	Arg	Asp	Pro	Lys	Tyr	Trp	Asp	Arg	Pro	Ser	Glu	Phe	Arg	Pro	Glu				
				405					410					415					
Arg	Phe	Leu	Glu	Thr	Gly	Ala	Glu	Gly	Glu	Ala	Arg	Pro	Leu	Asp	Leu				
			420					425					430						
Arg	Gly	Gln	His	Phe	Gln	Leu	Leu	Pro	Phe	Gly	Ser	Gly	Arg	Arg	Met				
		435				440						445							
Cys	Pro	Gly	Val	Asn	Leu	Ala	Thr	Ser	Gly	Met	Ala	Thr	Leu	Leu	Ala				
	450					455					460								
Ser	Leu	Ile	Gln	Cys	Phe	Asp	Leu	Gln	Val	Leu	Gly	Pro	Gln	Gly	Gln				
465					470					475					480				
Ile	Leu	Lys	Gly	Gly	Asp	Ala	Lys	Val	Ser	Met	Glu	Glu	Arg	Ala	Gly				
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Ile Gly Val Ala Ser Lys Leu Leu Ser  
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<210> 35  
<211> 1563  
<212> DNA  
<213> Pisum sativum

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<210> 36  
<211> 521  
<212> PRT  
<213> Pisum sativum

<400> 36  
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Pro Asn Pro Pro Ser Pro Lys Pro Arg Leu Pro Phe Ile Gly His Leu  
35 40 45  
His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Leu Ile Asp Leu Ser  
50 55 60

Lys	Lys	His	Gly	Pro	Leu	Phe	Ser	Leu	Ser	Phe	Gly	Ser	Met	Pro	Thr	65	70	75	80
Val	Val	Ala	Ser	Thr	Pro	Glu	Leu	Phe	Lys	Leu	Phe	Leu	Gln	Ala	His		85	90	95
Glu	Ala	Thr	Ser	Phe	Ser	Thr	Arg	Phe	Gln	Thr	Ser	Ala	Val	Arg	Arg	100		105	110
Leu	Thr	Tyr	Asp	Asn	Ser	Val	Ala	Met	Val	Pro	Phe	Gly	Pro	Tyr	Trp	115	120	125	
Lys	Phe	Val	Arg	Lys	Leu	Ile	Met	Asn	Asp	Leu	Leu	Asn	Ala	Thr	Thr	130	135	140	
Val	Asn	Glu	Leu	Arg	Pro	Leu	Arg	Thr	Gln	Gln	Ile	Arg	Lys	Phe	Leu	145	150	155	160
Arg	Val	Met	Ala	Gln	Ser	Ala	Glu	Ala	Gln	Lys	Pro	Leu	Asp	Val	Thr		165	170	175
Glu	Glu	Leu	Leu	Lys	Trp	Thr	Asn	Ser	Thr	Ile	Ser	Met	Met	Met	Leu	180	185	190	
Gly	Glu	Ala	Glu	Glu	Ile	Arg	Asp	Ile	Ala	Arg	Glu	Val	Leu	Lys	Ile	195	200	205	
Phe	Gly	Glu	Tyr	Ser	Leu	Thr	Asp	Phe	Ile	Trp	Pro	Leu	Lys	Tyr	Leu	210	215	220	
Lys	Val	Gly	Lys	Tyr	Glu	Lys	Arg	Ile	Asp	Asp	Ile	Leu	Asn	Lys	Phe	225	230	235	240
Asp	Pro	Val	Val	Glu	Arg	Val	Ile	Lys	Lys	Arg	Arg	Glu	Ile	Val	Arg		245	250	255
Arg	Arg	Lys	Asn	Gly	Glu	Val	Val	Glu	Gly	Glu	Ala	Ser	Gly	Val	Phe		260	265	270
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Ile	Thr	Lys	Glu	Gln	Ile	Lys	Gly	Leu	Val	Val	Asp	Phe	Phe	Ser	Ala	290	295	300	
Gly	Thr	Asp	Ser	Thr	Ala	Val	Ala	Thr	Glu	Trp	Ala	Leu	Ala	Glu	Leu	305	310	315	320
Ile	Asn	Asn	Pro	Arg	Val	Leu	Gln	Lys	Ala	Arg	Glu	Glu	Val	Tyr	Ser		325	330	335
Val	Val	Gly	Lys	Asp	Arg	Leu	Val	Asp	Glu	Val	Asp	Thr	Gln	Asn	Leu	340	345	350	
Pro	Tyr	Ile	Arg	Ala	Ile	Val	Lys	Glu	Thr	Phe	Arg	Met	His	Pro	Pro	355	360	365	
Leu	Pro	Val	Val	Lys	Arg	Lys	Cys	Thr	Glu	Glu	Cys	Glu	Ile	Asn	Gly	370	375	380	



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 Gly Lys Asp Pro Lys Tyr Trp Asp Arg Pro Ser Glu Phe Arg Pro Glu  
 405 410 415  
 Arg Phe Leu Glu Thr Gly Ala Glu Gly Glu Ala Gly Pro Leu Asp Leu  
 420 425 430  
 Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg Arg Met  
 435 440 445  
 Cys Pro Gly Val Asn Leu Ala Thr Ser Gly Met Ala Thr Leu Leu Ala  
 450 455 460  
 Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln Gly Gln  
 465 470 475 480  
 Ile Leu Lys Gly Asp Asp Ala Lys Val Ser Met Glu Glu Arg Ala Gly  
 485 490 495  
 Leu Thr Val Pro Arg Ala His Ser Leu Val Cys Val Pro Leu Ala Arg  
 500 505 510  
 Ile Gly Val Ala Ser Lys Leu Leu Ser  
 515 520

<210> 37

<211> 1496

<212> DNA

<213> *Trifolium repens*

<400> 37

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gcattggcag	agctcatcaa	caatcccagg	gtgttgcaaa	aggctcgtga	ggaggtctac	960
agtgttggtg	gcaaagatag	actcgttgac	gaagttgaca	ctcaaaacct	tccttacatt	1020
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tgacagaaag	agtgtgagat	taatgggtat	gtgatccag	agggagcatt	ggttcttttc	1140
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gagaggttct	tagaaactgg	tgctgaaggg	gaagcagggc	ctcttgatct	tagggggccag	1260
catttccaac	tcctcccatt	tgggtctggg	aggagaatgt	gccctggtgt	cagtttggtc	1320
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ggccctcaag	gacaaatatt	gaaaggtgat	gatgccaaaag	ttagcatgga	agagagagct	1440
ggcctcacag	ttccaagggc	acatagtctc	gtttgtgttc	cacttgcaag	gatcgg	1496

<210> 38  
 <211> 498  
 <212> PRT  
 <213> Trifolium repens

<400> 38

Ser	His	Leu	Arg	Pro	Thr	Pro	Ser	Ala	Ile	Ser	Lys	Ala	Leu	Arg	His
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Leu	Pro	Asn	Pro	Pro	Ser	Pro	Arg	Pro	Arg	Leu	Pro	Phe	Ile	Gly	His
			20					25					30		
Leu	His	Leu	Leu	Lys	Asp	Lys	Leu	Leu	His	Tyr	Ala	Pro	Ile	Asp	Leu
	35						40					45			
Ser	Lys	Lys	His	Gly	Pro	Leu	Phe	Ser	Leu	Ser	Phe	Gly	Ser	Met	Pro
	50					55					60				
Thr	Val	Val	Ala	Ser	Thr	Pro	Glu	Leu	Phe	Lys	Leu	Phe	Leu	Gln	Thr
65					70					75					80
His	Glu	Ala	Thr	Ser	Phe	Asn	Thr	Arg	Phe	Gln	Thr	Ser	Ala	Ile	Arg
				85					90					95	
His	Leu	Thr	Tyr	Asp	Asn	Ser	Val	Ala	Met	Val	Pro	Phe	Gly	Pro	Tyr
			100					105					110		
Trp	Lys	Phe	Val	Arg	Lys	Leu	Ile	Met	Asn	Asp	Leu	Leu	Asn	Ala	Thr
		115					120					125			
Thr	Val	Asn	Lys	Leu	Arg	Pro	Leu	Arg	Thr	Gln	Gln	Ile	Arg	Lys	Phe
	130					135						140			
Leu	Arg	Val	Met	Ala	Gln	Ser	Ala	Glu	Ala	Gln	Lys	Pro	Leu	Asp	Val
145					150					155					160
Thr	Glu	Glu	Leu	Leu	Lys	Trp	Thr	Asn	Ser	Thr	Ile	Ser	Met	Met	Met
				165					170					175	
Leu	Gly	Glu	Ala	Glu	Glu	Ile	Arg	Asp	Ile	Ala	Arg	Glu	Val	Leu	Lys
			180					185					190		
Ile	Phe	Gly	Glu	Tyr	Ser	Leu	Thr	Asp	Phe	Ile	Trp	Pro	Leu	Lys	Tyr
		195					200					205			
Leu	Lys	Val	Gly	Lys	Tyr	Glu	Lys	Arg	Ile	Asp	Asp	Ile	Leu	Asn	Lys
	210					215					220				
Phe	Asp	Pro	Val	Val	Glu	Arg	Val	Ile	Lys	Lys	Arg	Arg	Glu	Ile	Val
225					230					235					240
Arg	Arg	Arg	Lys	Asn	Gly	Glu	Val	Val	Glu	Gly	Glu	Ala	Ser	Gly	Val
				245					250					255	
Phe	Leu	Asp	Thr	Leu	Leu	Glu	Phe	Ala	Glu	Asp	Glu	Thr	Met	Glu	Ile
			260					265					270		
Lys	Ile	Thr	Lys	Glu	Gln	Ile	Lys	Gly	Leu	Val	Val	Asp	Phe	Phe	Ser
		275					280					285			

Ala Gly Thr Asp Ser Thr Ala Val Val Thr Glu Trp Ala Leu Ala Glu  
290 295 300

Leu Ile Asn Asn Pro Arg Val Leu Gln Lys Ala Arg Glu Glu Val Tyr  
305 310 315 320

Ser Val Val Gly Lys Asp Arg Leu Val Asp Glu Val Asp Thr Gln Asn  
325 330 335

Leu Pro Tyr Ile Arg Ala Ile Val Lys Glu Thr Phe Arg Met His Pro  
340 345 350

Pro Leu Pro Val Val Lys Arg Lys Cys Thr Glu Glu Cys Glu Ile Asn  
355 360 365

Gly Tyr Val Ile Pro Glu Gly Ala Leu Val Leu Phe Asn Val Trp Gln  
370 375 380

Val Gly Arg Asp Pro Lys Tyr Trp Asp Arg Pro Ser Glu Ser Arg Pro  
385 390 395 400

Glu Arg Phe Leu Glu Thr Gly Ala Glu Gly Glu Ala Gly Pro Leu Asp  
405 410 415

Leu Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg Arg  
420 425 430

Met Cys Pro Gly Val Ser Leu Ala Thr Ser Gly Met Ala Thr Leu Leu  
435 440 445

Ala Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln Gly  
450 455 460

Gln Ile Leu Lys Gly Asp Asp Ala Lys Val Ser Met Glu Glu Arg Ala  
465 470 475 480

Gly Leu Thr Val Pro Arg Ala His Ser Leu Val Cys Val Pro Leu Ala  
485 490 495

Arg Ile

<210> 39

<211> 1501

<212> DNA

<213> Trifolium repens

<400> 39

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aacttctcca	ctacgcactc	atcgacctct	ccaaaaaaca	tggtccctta	ttctctctct	180
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cctacgacaa	ctctgtggcc	atgggttccat	tcggacctta	ctggaagttc	gtgaggaagc	360
tcatcatgaa	cgaccttctc	aacgccacca	ccgtcaacaa	gctcaggcct	ttgaggaccc	420
aacagatccg	caagttcctt	aggggttatgg	cccaaagcgc	agaggcccag	aagccccttg	480
acgtcaccga	ggagcttctc	aaatggacca	acagcaccat	ctccatgatg	atgctcggcg	540
aggctgagga	gatcagagac	atcgctcgcg	aggttcttaa	gatcttcggc	gaatacagcc	600
tactgactt	catctggcct	ttgaagtatc	tcaaggttgg	aaagtatgag	aagaggattg	660
atgacatctt	gaacaagttc	gaccctgtcg	ttgaaagagt	catcaagaag	cgccgtgaga	720

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tcgtcagaag gagaaagaac ggagaagttg ttgagggcga ggccagcggc gtcttcctcg 780
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tcaagggcct tggtgtcgac tttttctctg cagggacaga ttccacagcg gtggcaacag 900
agtgggcatt ggcagagctc atcaacaatc ccaaggtgtt gcaaaaggct cgtgaggagg 960
cctacagtgt tgtgggcaaa gatagactcg ttgacgaagt tgacactcaa aaccttcctt 1020
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gccagcattt ccaactcctc ccatttgggt ctgggaggag aatgtgccct ggtgtcaatt 1320
tggtacttcc aggaatggca acacttcttg catctcttat ccaatgcttt gacctgcaag 1380
tgctgggccc tcaaggacaa atattgaaag gtgatgatgc caaagttagc atggaagaga 1440
gagctggcct cacagttcca agggcacata gtctcgtttg tgttcactt gcaaggatcg 1500
g 1501

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<210> 40

<211> 499

<212> PRT

<213> *Trifolium repens*

<400> 40

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Phe Leu His Leu Arg Pro Thr Pro Thr Ala Lys Ser Lys Ala Leu Arg
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His Leu Pro Asn Pro Pro Ser Pro Lys Pro Arg Leu Pro Phe Ile Gly
      20              25              30

His Leu His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Leu Ile Asp
      35              40              45

Leu Ser Lys Lys His Gly Pro Leu Phe Ser Leu Tyr Phe Gly Ser Met
      50              55              60

Pro Thr Val Val Ala Ser Thr Pro Glu Leu Phe Lys Leu Phe Leu Gln
      65              70              75              80

Thr His Glu Ala Thr Ser Phe Asn Thr Arg Phe Gln Thr Ser Ala Ile
      85              90              95

Arg Arg Leu Thr Tyr Asp Asn Ser Val Ala Met Val Pro Phe Gly Pro
      100              105              110

Tyr Trp Lys Phe Val Arg Lys Leu Ile Met Asn Asp Leu Leu Asn Ala
      115              120              125

Thr Thr Val Asn Lys Leu Arg Pro Leu Arg Thr Gln Gln Ile Arg Lys
      130              135              140

Phe Leu Arg Val Met Ala Gln Ser Ala Glu Ala Gln Lys Pro Leu Asp
      145              150              155              160

Val Thr Glu Glu Leu Leu Lys Trp Thr Asn Ser Thr Ile Ser Met Met
      165              170              175

Met Leu Gly Glu Ala Glu Glu Ile Arg Asp Ile Ala Arg Glu Val Leu
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Lys Ile Phe Gly Glu Tyr Ser Leu Thr Asp Phe Ile Trp Pro Leu Lys
      195              200              205

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Tyr Leu Lys Val Gly Lys Tyr Glu Lys Arg Ile Asp Asp Ile Leu Asn  
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 Lys Phe Asp Pro Val Val Glu Arg Val Ile Lys Lys Arg Arg Glu Ile  
 225 230 235 240  
 Val Arg Arg Arg Lys Asn Gly Glu Val Val Glu Gly Glu Ala Ser Gly  
 245 250 255  
 Val Phe Leu Asp Thr Leu Leu Glu Phe Ala Glu Asp Glu Thr Met Glu  
 260 265 270  
 Ile Lys Ile Thr Lys Glu Gln Ile Lys Gly Leu Val Val Asp Phe Phe  
 275 280 285  
 Ser Ala Gly Thr Asp Ser Thr Ala Val Ala Thr Glu Trp Ala Leu Ala  
 290 295 300  
 Glu Leu Ile Asn Asn Pro Lys Val Leu Gln Lys Ala Arg Glu Glu Ala  
 305 310 315 320  
 Tyr Ser Val Val Gly Lys Asp Arg Leu Val Asp Glu Val Asp Thr Gln  
 325 330 335  
 Asn Leu Pro Tyr Ile Arg Ala Ile Val Lys Glu Thr Phe Arg Met His  
 340 345 350  
 Pro Pro Leu Pro Val Val Lys Arg Lys Cys Thr Glu Glu Cys Gly Ile  
 355 360 365  
 Asn Gly Tyr Val Ile Pro Glu Gly Ala Leu Val Leu Phe Asn Val Trp  
 370 375 380  
 Gln Val Gly Arg Asp Pro Lys Tyr Trp Asp Arg Pro Ser Glu Phe Arg  
 385 390 395 400  
 Pro Glu Arg Phe Leu Glu Thr Gly Ala Glu Gly Glu Ala Gly Pro Leu  
 405 410 415  
 Asp Leu Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg  
 420 425 430  
 Arg Met Cys Pro Gly Val Asn Leu Ala Thr Ser Gly Met Ala Thr Leu  
 435 440 445  
 Leu Ala Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln  
 450 455 460  
 Gly Gln Ile Leu Lys Gly Asp Asp Ala Lys Val Ser Met Glu Glu Arg  
 465 470 475 480  
 Ala Gly Leu Thr Val Pro Arg Ala His Ser Leu Val Cys Val Pro Leu  
 485 490 495  
 Ala Arg Ile

<210> 41  
 <211> 21  
 <212> DNA

<213> Artificial Sequence

<220>

<223> PCR primer

<400> 41  
 ttgctggaac ttgcacttgg t 21

<210> 42  
 <211> 32  
 <212> DNA  
 <213> Artificial Sequence

<220>

<223> PCR primer

<400> 42  
 gtatatgatg ggtaccttaa ttaagaaagg ag 32

<210> 43  
 <211> 26  
 <212> DNA  
 <213> Artificial Sequence

<220>

<223> PCR primer

<400> 43  
 gacgcctcac ttacgacaac tctgtg 26

<210> 44  
 <211> 25  
 <212> DNA  
 <213> Artificial Sequence

<220>

<223> PCR primer

<400> 44  
 cctctcggga cggaattctg atggt 25

<210> 45  
 <211> 25  
 <212> DNA  
 <213> Artificial Sequence

<220>

<223> PCR primer

<400> 45  
 gcggtgcacg ggcggactct tcttc 25

<210> 46  
 <211> 25  
 <212> DNA  
 <213> Artificial Sequence

<220>

<223> PCR primer

<400> 46  
cgcccaatac gcaaaccgcc tctcc

25

<210> 47  
<211> 1501  
<212> DNA  
<213> Beta vulgaris

<400> 47  
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aacttctcca ctacgcactc atcgacctct ccaaaaaaca tggccctta ttctctctct 180  
actttggctc catgcccaacc gttggtgcct ccacaccaga attgttcaag ctcttcctcc 240  
aaacgcacga ggcaacttcc ttcaacacaa ggttccaaac ctcagccata agacgcctca 300  
cctatgatag ctacgtggcc atggttccct tcggacctta ctggaagttc gtgaggaagc 360  
tcatcatgaa cgaccttctc aacgccacca ctgtaaaciaa gttgaggcct ttgaggaccc 420  
aacagatccg caagttcctt aggggttatgg cccaaggcgc agaggcacag aagccccttg 480  
acttgaccga ggagcttctg aaatggacca acagcaccat ctccatgatg atgctcggcg 540  
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tactgactt catctggcca ttgaagcatc tcaagggttg aaagtatgag aagaggatcg 660  
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tggtacttcc gggaatggca acacttcttg catctcttat tcagtgtctt gacttgcaag 1380  
tgctgggtcc acaaggacag atattgaagg gtggtgacgc caaagttagc atggaagaga 1440  
gagccggcct cactgttcca agggcacata gtcttgtctg tgttccactt gcaaggatcg 1500  
g 1501

<210> 48  
<211> 499  
<212> PRT  
<213> Beta vulgaris

<400> 48  
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His Leu Pro Asn Pro Pro Ser Pro Lys Pro Arg Leu Pro Phe Ile Gly  
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His Leu His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Leu Ile Asp  
35 40 45  
Leu Ser Lys Lys His Gly Pro Leu Phe Ser Leu Tyr Phe Gly Ser Met  
50 55 60  
Pro Thr Val Val Ala Ser Thr Pro Glu Leu Phe Lys Leu Phe Leu Gln  
65 70 75 80  
Thr His Glu Ala Thr Ser Phe Asn Thr Arg Phe Gln Thr Ser Ala Ile  
85 90 95

Arg	Arg	Leu	Thr	Tyr	Asp	Ser	Ser	Val	Ala	Met	Val	Pro	Phe	Gly	Pro		
			100					105						110			
Tyr	Trp	Lys	Phe	Val	Arg	Lys	Leu	Ile	Met	Asn	Asp	Leu	Leu	Asn	Ala		
		115					120					125					
Thr	Thr	Val	Asn	Lys	Leu	Arg	Pro	Leu	Arg	Thr	Gln	Gln	Ile	Arg	Lys		
		130				135					140						
Phe	Leu	Arg	Val	Met	Ala	Gln	Gly	Ala	Glu	Ala	Gln	Lys	Pro	Leu	Asp		
145					150					155					160		
Leu	Thr	Glu	Glu	Leu	Leu	Lys	Trp	Thr	Asn	Ser	Thr	Ile	Ser	Met	Met		
				165					170					175			
Met	Leu	Gly	Glu	Ala	Glu	Glu	Ile	Arg	Asp	Ile	Ala	Arg	Glu	Val	Leu		
			180					185					190				
Lys	Ile	Phe	Gly	Glu	Tyr	Ser	Leu	Thr	Asp	Phe	Ile	Trp	Pro	Leu	Lys		
		195					200					205					
His	Leu	Lys	Val	Gly	Lys	Tyr	Glu	Lys	Arg	Ile	Asp	Asp	Ile	Leu	Asn		
	210					215					220						
Lys	Phe	Asp	Pro	Val	Val	Glu	Arg	Val	Ile	Lys	Lys	Arg	Arg	Glu	Ile		
225					230					235					240		
Val	Arg	Arg	Arg	Lys	Asn	Gly	Glu	Asp	Val	Glu	Gly	Glu	Val	Ser	Gly		
				245				250						255			
Val	Phe	Leu	Asp	Thr	Leu	Leu	Glu	Phe	Ala	Glu	Asp	Glu	Thr	Met	Glu		
			260					265					270				
Ile	Lys	Ile	Thr	Lys	Asp	His	Ile	Lys	Gly	Leu	Val	Val	Asp	Phe	Phe		
		275					280					285					
Ser	Ala	Gly	Thr	Asp	Ser	Thr	Ala	Val	Ala	Thr	Glu	Trp	Ala	Leu	Ala		
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Glu	Leu	Ile	Asn	Asn	Pro	Lys	Val	Leu	Glu	Lys	Ala	Arg	Glu	Glu	Val		
305					310					315					320		
Tyr	Ser	Val	Val	Gly	Lys	Asp	Arg	Leu	Val	Asp	Glu	Val	Asp	Thr	Gln		
				325				330						335			
Asn	Leu	Pro	Tyr	Ile	Arg	Ala	Ile	Val	Lys	Glu	Thr	Phe	Arg	Met	His		
		340					345						350				
Pro	Pro	Leu	Pro	Val	Val	Lys	Arg	Lys	Cys	Ile	Glu	Glu	Cys	Glu	Ile		
		355					360					365					
Asn	Gly	Tyr	Val	Ile	Pro	Glu	Gly	Ala	Leu	Ile	Leu	Phe	Asn	Val	Trp		
	370					375					380						
Gln	Val	Gly	Arg	Asp	Pro	Lys	Tyr	Trp	Asp	Arg	Pro	Ser	Glu	Phe	Arg		
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Pro	Glu	Arg	Phe	Leu	Glu	Thr	Gly	Ala	Glu	Gly	Glu	Ala	Arg	Leu	Leu		
			405						410					415			



Asp Leu Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg  
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 Arg Met Cys Pro Gly Val Asn Leu Ala Thr Ser Gly Met Ala Thr Leu  
                   435                                  440                                  445  
 Leu Ala Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln  
                   450                                  455                                  460  
 Gly Gln Ile Leu Lys Gly Gly Asp Ala Lys Val Ser Met Glu Glu Arg  
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 Ala Gly Leu Thr Val Pro Arg Ala His Ser Leu Val Cys Val Pro Leu  
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Ala Arg Ile

<210> 49  
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 <212> DNA  
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<210> 50  
 <211> 30  
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<220>  
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<400> 50  
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<210> 51  
 <211> 27  
 <212> DNA  
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<220>  
 <223> PCR primer

<400> 51  
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<210> 52  
 <211> 1801  
 <212> DNA  
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<220>  
 <221> intron  
 <222> (895)..(1112)

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c 1801

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<210> 53
<211> 1900
<212> DNA
<213> Glycine max

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<220>
<221> intron
<222> (947)..(1082)

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tgagggtgag gtcagcgggg ttttcttga cactttgctt gaattcgctg aggatgagac 900
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tcattcattg atcgaaatat gcagtatttt gtaacaaga gatcgagaat tgacatttat 1020

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<210> 54

<211> 1501

<212> DNA

<213> Lupinus albus

<400> 54

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aacttctcca	ctacgcactc	atcgacctct	caaaaaaca	tggctccctta	ttctctctct	180
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gaaagtgcac	agaagagtgt	gagattaatg	gatatgtgat	cccagagggga	gcattgattc	1140
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tgctgggtcc	acaaggacag	atattgaagg	gtggtgacgc	caaagttagc	atggaagaga	1440
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g						1501

<210> 55

<211> 499

<212> PRT

<213> Lupinus albus

<400> 49

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1				5					10					15	

His	Leu	Pro	Asn	Pro	Pro	Ser	Pro	Lys	Pro	Arg	Leu	Pro	Phe	Ile	Gly
			20					25					30		

His	Leu	His	Leu	Leu	Lys	Asp	Lys	Leu	Leu	His	Tyr	Ala	Leu	Ile	Asp	35	40	45
Leu	Ser	Lys	Lys	His	Gly	Pro	Leu	Phe	Ser	Leu	Tyr	Phe	Gly	Ser	Met	50	55	60
Pro	Thr	Val	Val	Ala	Ser	Thr	Pro	Glu	Leu	Phe	Lys	Leu	Phe	Leu	Gln	65	70	75
Thr	His	Glu	Ala	Thr	Ser	Phe	Asn	Thr	Arg	Phe	Gln	Thr	Ser	Ala	Ile	85	90	95
Arg	Arg	Leu	Thr	Tyr	Asp	Ser	Ser	Val	Ala	Arg	Val	Pro	Phe	Gly	Pro	100	105	110
Tyr	Trp	Lys	Phe	Val	Arg	Lys	Leu	Ile	Met	Asn	Asp	Leu	Leu	Asn	Ala	115	120	125
Thr	Thr	Val	Asn	Lys	Leu	Arg	Pro	Leu	Arg	Thr	Gln	Gln	Ile	Arg	Lys	130	135	140
Phe	Leu	Arg	Val	Met	Ala	Gln	Gly	Ala	Glu	Ala	Gln	Lys	Pro	Leu	Asp	145	150	155
Leu	Thr	Glu	Glu	Leu	Leu	Lys	Trp	Thr	Asn	Ser	Thr	Ile	Ser	Met	Met	165	170	175
Met	Leu	Gly	Glu	Ala	Glu	Glu	Ile	Arg	Asp	Ile	Ala	Arg	Glu	Val	Leu	180	185	190
Lys	Ile	Phe	Gly	Glu	Tyr	Ser	Leu	Thr	Asp	Phe	Ile	Trp	Pro	Leu	Lys	195	200	205
His	Leu	Lys	Val	Gly	Lys	Tyr	Glu	Lys	Arg	Ile	Asp	Asp	Ile	Leu	Asn	210	215	220
Lys	Phe	Asp	Pro	Val	Val	Glu	Arg	Val	Ile	Lys	Lys	Arg	Arg	Glu	Ile	225	230	235
Val	Arg	Arg	Arg	Lys	Asn	Gly	Glu	Val	Val	Glu	Gly	Glu	Val	Ser	Gly	245	250	255
Val	Leu	Leu	Asp	Thr	Leu	Leu	Glu	Phe	Ala	Glu	Asp	Glu	Thr	Met	Glu	260	265	270
Ile	Lys	Ile	Thr	Lys	Asp	His	Ile	Lys	Gly	Leu	Val	Val	Asp	Phe	Phe	275	280	285
Ser	Ala	Gly	Thr	Asp	Ser	Thr	Ala	Val	Ala	Thr	Glu	Trp	Ala	Leu	Ala	290	295	300
Glu	Leu	Ile	Asn	Asn	Pro	Lys	Val	Leu	Glu	Arg	Ala	Arg	Glu	Glu	Val	305	310	315
Tyr	Ser	Val	Val	Gly	Lys	Asp	Arg	Leu	Val	Asp	Glu	Val	Asp	Thr	Gln	325	330	335
Asn	Leu	Pro	Tyr	Ile	Arg	Ala	Ile	Val	Lys	Glu	Thr	Phe	Arg	Met	His	340	345	350

Pro Pro Leu Pro Val Val Lys Arg Lys Cys Thr Glu Glu Cys Glu Ile  
 355 360 365  
 Asn Gly Tyr Val Ile Pro Glu Gly Ala Leu Ile Leu Phe Asn Val Trp  
 370 375 380  
 Gln Val Gly Arg Asp Pro Lys Tyr Trp Asp Arg Pro Ser Glu Phe Arg  
 385 390 395 400  
 Pro Glu Arg Phe Leu Glu Thr Glu Ala Glu Gly Glu Ala Arg Pro Leu  
 405 410 415  
 Asp Leu Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg  
 420 425 430  
 Arg Met Cys Pro Gly Val Ile Leu Ala Thr Ser Gly Met Ala Thr Leu  
 435 440 445  
 Leu Ala Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln  
 450 455 460  
 Gly Gln Ile Leu Lys Gly Gly Asp Ala Lys Val Ser Met Glu Glu Arg  
 465 470 475 480  
 Ala Gly Leu Thr Val Pro Arg Ala His Ser Leu Val Cys Val Pro Leu  
 485 490 495

Ala Arg Ile

<210> 56

<211> 1501

<212> DNA

<213> Medicago sativa

<400> 56

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 aacttctcca ctacgcactc atcgacctct ccaaaaaaca tgggccctta ttctctctct 180  
 actttggctc catgcccaacc gttgttgccct ccacaccaga attgttcaag ctcttccttc 240  
 aaacgcacga ggcaacttcc ttcaacacaa ggttccaaac ctcagccata agacgcctca 300  
 cctatgatag ctcaagtggcc atggctccct tcggacctta ctggaagttc gtgaggaagc 360  
 tcatcatgaa cgaccttctc aacgccacca ctgtaaaca gttgaggcct ttgaggacc 420  
 aacagatccg caagttcctt aggggttatgg cccaaggcgc agaggcacag aagccccttg 480  
 acttgaccga ggagcttctg aaatggacca acagcaccac ctccatgatg atgctcggcg 540  
 aggctgagga gatcagagac atcgcccgcg aggttcttaa gatctttggc gaatacagcc 600  
 tcaactgactt catccggcca ttgaagcatc tcaaggttgg aaagtatgag aagaggatcg 660  
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 gtcctgagag gttcctagag acaggggctg aaggggaagc aaggcctctt gatcttaggg 1260  
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 tgctgggtcc acaaggacag atattgaagg gtggtgacgc caaagttagc atggaagaga 1440

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g 1501

<210> 57

<211> 499

<212> PRT

<213> Medicago sativa

<400> 57

Phe Leu His Leu Arg Pro Thr Pro Thr Ala Lys Ser Lys Ala Leu Arg  
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His Leu Pro Asn Pro Pro Ser Pro Lys Pro Arg Leu Pro Phe Ile Gly  
20 25 30

His Leu His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Leu Ile Asp  
35 40 45

Leu Ser Lys Lys His Gly Pro Leu Phe Ser Leu Tyr Phe Gly Ser Met  
50 55 60

Pro Thr Val Val Ala Ser Thr Pro Glu Leu Phe Lys Leu Phe Leu Gln  
65 70 75 80

Thr His Glu Ala Thr Ser Phe Asn Thr Arg Phe Gln Thr Ser Ala Ile  
85 90 95

Arg Arg Leu Thr Tyr Asp Ser Ser Val Ala Met Ala Pro Phe Gly Pro  
100 105 110

Tyr Trp Lys Phe Val Arg Lys Leu Ile Met Asn Asp Leu Leu Asn Ala  
115 120 125

Thr Thr Val Asn Lys Leu Arg Pro Leu Arg Thr Gln Gln Ile Arg Lys  
130 135 140

Phe Leu Arg Val Met Ala Gln Gly Ala Glu Ala Gln Lys Pro Leu Asp  
145 150 155 160

Leu Thr Glu Glu Leu Leu Lys Trp Thr Asn Ser Thr Thr Ser Met Met  
165 170 175

Met Leu Gly Glu Ala Glu Glu Ile Arg Asp Ile Ala Arg Glu Val Leu  
180 185 190

Lys Ile Phe Gly Glu Tyr Ser Leu Thr Asp Phe Ile Arg Pro Leu Lys  
195 200 205

His Leu Lys Val Gly Lys Tyr Glu Lys Arg Ile Asp Asp Ile Leu Asn  
210 215 220

Lys Phe Asp Pro Val Val Glu Arg Val Ile Lys Lys Arg Arg Glu Ile  
225 230 235 240

Val Arg Arg Arg Lys Asn Gly Glu Val Val Glu Gly Glu Val Ser Gly  
245 250 255

Val Phe Leu Asp Thr Leu Leu Glu Phe Ala Glu Asp Glu Thr Thr Glu  
260 265 270

Ile Lys Ile Thr Lys Asp His Ile Lys Gly Leu Val Val Asp Phe Phe  
 275 280 285  
 Ser Ala Gly Thr Asp Ser Thr Ala Val Ala Thr Glu Trp Ala Leu Ala  
 290 295 300  
 Glu Leu Ile Asn Asn Pro Lys Val Leu Glu Lys Ala Arg Glu Glu Val  
 305 310 315 320  
 Tyr Ser Val Val Gly Lys Asp Arg Leu Val Asp Glu Val Asp Thr Gln  
 325 330 335  
 Asn Leu Pro Tyr Ile Arg Ala Ile Val Lys Glu Thr Phe Arg Met His  
 340 345 350  
 Pro Pro Leu Pro Val Val Lys Arg Lys Cys Thr Glu Glu Cys Glu Ile  
 355 360 365  
 Asn Gly Tyr Val Ile Pro Glu Gly Ala Leu Ile Leu Phe Asn Val Trp  
 370 375 380  
 Gln Val Gly Arg Asp Ser Lys Tyr Trp Asp Arg Pro Ser Glu Phe Arg  
 385 390 395 400  
 Pro Glu Arg Phe Leu Glu Thr Gly Ala Glu Gly Glu Ala Arg Pro Leu  
 405 410 415  
 Asp Leu Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg  
 420 425 430  
 Arg Met Cys Pro Gly Val Asn Leu Ala Thr Ser Gly Met Ala Thr Leu  
 435 440 445  
 Leu Ala Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln  
 450 455 460  
 Gly Gln Ile Leu Lys Gly Gly Asp Ala Lys Val Ser Met Glu Glu Arg  
 465 470 475 480  
 Ala Gly Leu Thr Val Pro Arg Ala His Ser Leu Val Cys Val Pro Leu  
 485 490 495  
 Ala Arg Ile

<210> 58  
 <211> 1501  
 <212> DNA  
 <213> Medicago sativa

<400> 58  
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 aacttctcca ctacgcactc atcgacctct ccaaaaaaca tggtcctta ttctctctct 180  
 actttggctc catgccaacc gttgttgctt ccacaccaga attgttcaag ctcttcctcc 240  
 aaacgcacga ggcaacttcc ttcaacacaa ggttccaaac ctcagccata agacgcctca 300  
 cctatgatag ctcaagtggcc atgggtccct tcggacctta ctggaagttc gtgaggaagc 360  
 tcatcatgaa cgaccttctc aacgccacca ctgtaaaciaa gttgaggcct ttgaggaccc 420  
 aacagatccg caagctcctt aggggttatgg cccaaggcgc agaggcacag aagccccttg 480

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gaaagtgcac agaagagtgt gagattaatg gatatgtgat cccagaggga gcattgattc 1140
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gtcctgagag gttcctagag acaggggctg aaggggaagc aaggcctctt gatcttaggg 1260
gacaacattt tcaacttctc ccatttgggt ctgggaggag aatgtgccct ggagtcaatc 1320
tggctacttc gggaatggca acacttcttg catctcttat tcagtgtctt gacttgcaag 1380
tgctgggtcc acaaggacag atattgaagg gtggtgacgc caaagttagc atggaagaga 1440
ggccggcct cactgttcca agggcacata gtctgtctg tgttccactt gcaaggatcg 1500
g

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<210> 59

<211> 499

<212> PRT

<213> *Medicago sativa*

<400> 59

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Phe Leu His Leu Arg Pro Thr Pro Thr Ala Lys Ser Lys Ala Leu Arg
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His Leu Pro Asn Pro Pro Ser Pro Lys Pro Arg Leu Pro Phe Ile Gly
                20                      25                      30

His Leu His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Leu Ile Asp
    35                      40                      45

Leu Ser Lys Lys His Gly Pro Leu Phe Ser Leu Tyr Phe Gly Ser Met
    50                      55                      60

Pro Thr Val Val Ala Ser Thr Pro Glu Leu Phe Lys Leu Phe Leu Gln
    65                      70                      75                      80

Thr His Glu Ala Thr Ser Phe Asn Thr Arg Phe Gln Thr Ser Ala Ile
                85                      90                      95

Arg Arg Leu Thr Tyr Asp Ser Ser Val Ala Met Val Pro Phe Gly Pro
    100                      105                      110

Tyr Trp Lys Phe Val Arg Lys Leu Ile Met Asn Asp Leu Leu Asn Ala
    115                      120                      125

Thr Thr Val Asn Lys Leu Arg Pro Leu Arg Thr Gln Gln Ile Arg Lys
    130                      135                      140

Leu Leu Arg Val Met Ala Gln Gly Ala Glu Ala Gln Lys Pro Leu Asp
    145                      150                      155                      160

Leu Thr Glu Glu Leu Leu Lys Trp Thr Asn Ser Thr Ile Ser Met Met
    165                      170                      175

Met Leu Gly Glu Ala Glu Glu Ile Arg Asp Ile Ala Arg Glu Val Leu
    180                      185                      190

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Lys Ile Phe Gly Glu Tyr Ser Leu Thr Asp Phe Ile Trp Pro Leu Lys  
 195 200 205  
 His Leu Lys Val Gly Lys Tyr Glu Lys Arg Ile Asp Asp Ile Leu Asn  
 210 215 220  
 Lys Phe Asp Pro Val Val Glu Arg Val Ile Lys Lys Arg Arg Glu Ile  
 225 230 235 240  
 Val Arg Arg Arg Lys Asn Gly Glu Val Ile Glu Gly Glu Val Ser Gly  
 245 250 255  
 Val Phe Leu Asp Thr Leu Leu Glu Phe Ala Glu Asp Glu Thr Thr Glu  
 260 265 270  
 Ile Lys Ile Thr Lys Asp His Ile Lys Gly Leu Val Val Asp Phe Phe  
 275 280 285  
 Ser Ala Gly Thr Asp Ser Thr Ala Val Ala Thr Glu Trp Ala Leu Ala  
 290 295 300  
 Glu Leu Ile Asn Asn Pro Lys Val Leu Glu Lys Ala Arg Glu Glu Val  
 305 310 315 320  
 Tyr Ser Val Val Gly Lys Asp Arg Leu Val Asp Glu Val Asp Thr Gln  
 325 330 335  
 Asn Leu Pro Tyr Ile Arg Ala Ile Val Lys Glu Thr Phe Arg Met His  
 340 345 350  
 Pro Pro Leu Pro Val Val Lys Arg Lys Cys Thr Glu Glu Cys Glu Ile  
 355 360 365  
 Asn Gly Tyr Val Ile Pro Glu Gly Ala Leu Ile Leu Phe Asn Val Trp  
 370 375 380  
 Gln Val Gly Arg Asp Pro Lys Tyr Trp Asp Arg Pro Ser Glu Phe Arg  
 385 390 395 400  
 Pro Glu Arg Phe Leu Glu Thr Gly Ala Glu Gly Glu Ala Arg Pro Leu  
 405 410 415  
 Asp Leu Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg  
 420 425 430  
 Arg Met Cys Pro Gly Val Asn Leu Ala Thr Ser Gly Met Ala Thr Leu  
 435 440 445  
 Leu Ala Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln  
 450 455 460  
 Gly Gln Ile Leu Lys Gly Gly Asp Ala Lys Val Ser Met Glu Glu Arg  
 465 470 475 480  
 Ala Gly Leu Thr Val Pro Arg Ala His Ser Leu Val Cys Val Pro Leu  
 485 490 495  
 Ala Arg Ile

<210> 60  
 <211> 1497  
 <212> DNA  
 <213> Beta vulgaris

<400> 60  
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 tctccactac gcactcatcg acctctccaa aaaacatggg cccttattct ctcactactt 180  
 tgggtccatg ccaaccgttg ttgcctccac accagaattg ttcaagctct tcctccaaac 240  
 gaacgaggca acttccttca acacaagggt ccaaacctca gccataagac gcctcaccta 300  
 tgatagctca gtggccatgg ttcccttcgg accttactgg aagttcgtga ggaagctcat 360  
 catgaacgac cttctcaacg ccaccactgt aaacaagttg aggcctttga ggacccaaca 420  
 gatccgcaag ttccttaggg ctatggccca aggcgcagag gcacggaagc cccttgactt 480  
 gaccgaggag cttctgaaat gggccaacag caccatctcc atgatgatgc tcggcgaggc 540  
 tgaggagatc agagacatcg ctgcgcagggt tcttaagatc tttggcgaat acagcctcac 600  
 tgacttcacg tggccattga agcatctcaa ggttggaag tatgagaaga ggatcgacga 660  
 catcttgaac aagttcgacc ctgtcggtga aagagtcac aagaagcgcc gtgagatcgt 720  
 gaggaggaga aagaacggag aggttggtga gggtaggtc agcgggggtt tccttgacac 780  
 tttgcttgaa ttcgtgagg atgagaccat ggagatcaaa atcaccaagg accacaccaa 840  
 gggctctgtt gtcgacttct tctcgccagg aacagactcc acagcgggtg caacagagt 900  
 ggcattggca gaactcatca acaatcctaa ggtgttgga aaggctcgtg agggagtcta 960  
 cagtgttgtg ggaaaggaca gacttggtga cgaagttgac actcaaaacc ttccttacat 1020  
 tagagcaatc gtgaaggaga cattccgcat gcacccgcca ctcccagtgg tcaaaagaaa 1080  
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 Ser Lys Lys His Gly Pro Leu Phe Ser His Tyr Phe Gly Ser Met Pro  
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Cys Pro Gly Val Xaa Leu Ala Thr Ser Gly Xaa Ala Thr Leu Leu Ala						
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Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln Gly Gln						
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